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ROCKS and MINERALS

Official Journal of the Rocks and Minerals Association

A Magazine for Mineralogists, Geologists and Collectors

DECEMBER, 1945

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Vol. 20, No. 12 Whole No. 173

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ROCKS and MINERALS
PUBLISHED MONTHLY

Edited and Published by
PETER ZODAC

December
1945

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

Merry Christmas and a Happy New Year

This is indeed a Merry Christmas for the world as the cruel wars being waged during the past few years have come to an end. But peace — a Holy Christian Peace — is not yet with us as the world is still in an unsettled condition. We must, therefore, continue to petition our God with prayers so that a Holy Christian Peace may again be with us all.

Emeralds in Austria

Emeralds have been found in Austria for many years. The occurrence is in the western part of the country, in the Pinzgau district of western Salzburg province.

The emeralds occur as small sharp crystals of grass green to deep green color imbedded in mica schist. Although the quality of the emeralds is not as good as that of the emeralds from Co'ombia, or from the Ural Mts., and even though they are found at an almost inaccessible locality in the high Salzburg Mountains, they have nevertheless been used as gems and many thousands of them have been mined.

The mines are in the Habachtal, about 7 miles S. E. of the small hamlet of Habach, and located on a steep precipice at an elevation of 8,700 ft. above sea level.

Habachtal (Habach Valley) is about 8 miles long. It begins at Habach and extends southeast to end at the Habach Kees (Habach glacier).

Another famous valley, mineralogically, is in the neighborhood. This is the Untersulzbachtal, 2½ miles to the west, which parallels the Habachtal. The world's finest epidote crystals are found in the Untersulzbachtal.

A note from Dr. L. J. Spencer, of London, England, editor of *"The Mineralogical Magazine,* reads: "The old workings for emerald are in the Legbach ravine in a vein of biotite-schist. Another occurrence of green beryl has been found in biotite-schist on the opposite (western) side of the Habach valley."

Amber Mines of Burma, India

The amber mines of Burma are situated in the Myitkyina district on a hill 3 miles southwest of Maingkwan, on the upper reach of the Chindwin River, in the Hukong Valley. Their geographical location is 26° 15' N. lat. and 96° 30' E. long (in the northern part of Upper Burma). Burma is the largest province of India and is in the extreme eastern part of the country.

The amber is of a deep red color and is called burmite, after the province in which it is found. It occurs in blue-gray clay of Lower Miocene age and is associated with lignite. The mineral is mined by sinking small shafts 20 to 40 feet deep, which on reaching the blue or amber-bearing clay are connected. The excavated material is hoisted to the surface in bamboo baskets where it is examined by women and children and all amber is picked out.

The amber varies in size and color and quality. Some is clear and transparent, some dense and cemented by calcite; the color varies from deep red to pale yellow or golden to a dingy dark brown. The deep red transparent varieties are the most precious and valuable. Some amazingly fine specimens of cut and polished burmite are known.

Burmite is used chiefly for ornaments and most of it goes to China.

REFERENCE

The Book of Amber, by Dr. George C. Williamson. Ernest Benn Ltd., London, England, 1932, p. 218.

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Whole No. 173

A METHOD FOR THE CONSTRUCTION OF CRYSTAL MODELS.

By HORACE R. BLANK

Southwestern University, Georgetown, Texas

Abstract.

A method is described by which crystal models may be made from sticks, strings, and paper or cardboard, when the intercepts of the faces on the crystallographic axes are known. The shapes of the faces need not be known. The axial cross is first constructed, and the position of each plane which forms a face of the crystal is found by connecting its intercepts with strings. Strings are then tied along the lines of intersection of these planes. The crystal faces are thus outlined, and the model may be completed by fastening paper or cardboard faces over the outlined areas.

Introduction.

In teaching elementary crystallography as part of a course in general mineralogy, the writer has found the wartime impossibility of obtaining wooden crystal models a considerable handicap. Their manufacture requires equipment which the average college or university science departmnt does not possess. Substitutes may be made by cutting out and folding pieces of paper or cardboard. Fisher[1] has described a method by which the exact shapes of the faces of a model to be constructed in this way may be obtained from the gnomonic projection of a given crystal.

The present method builds a model from the center outward, so to speak, when the intercepts of the faces on the crystallographic axes are known. The axial cross is first constructed, and the position of each plane which forms a face of the crystal is found by connecting its intercepts with strings. Strings are then tied along the lines of intersection of these planes. The crystal faces are thus outlined, and the model may be completed by fastening paper or cardboard faces over the outlined areas.

Models from Sticks and Strings.

In constructing the axial cross, it was found best to saw out first, from a piece of ordinary "one inch" finished board of even-grained wood, a block having faces perpendicular to each of the desired axes. Holes are then drilled in the block to support the sticks used as axes, which are firmly glued into place. (Five-sixteenth inch dowel sticks made the most satisfactory axes, but when these became difficult to obtain, square "rippings" from a lumber yard were made to answer by whittling their ends round to fit into the central block).

Unit distances from the center are then marked off on each axis according to any desired axial ratio, and multiples of these distances also marked. Cutting transverse grooves at these points assures a firmer fastening for the strings.

Each plane cutting three or more axes can then be outlined by tying strings to connect its intercepts, according to its Naumann symbols or the reciprocals of its Miller indices. This should be done in each of the octants or dodecants to obtain all possible faces of the same form. Planes parallel to an axis require an external framework of sticks perpendicular to this same axis, to which the strings can be attached. The square "rippings" above referred to are very satisfactory for this purpose, as they can be nailed and

1 Fisher, D. J. — "Making Crystal Models" — *Am. Mineral.* 26, 718-726 (Dec., 1941).

glued across the ends of the axes (Fig. 1).

Development of Forms.

The edge produced by the intersection of any two of the crystal faces is next found by finding any two points, each of which lies in both planes which form the faces in question and then connecting these points with a string. On many models, if strings are tied to represent the intersections of the desired planes with the axial planes, the desired points will be located where these strings cross. (Fig. 3 and 5). On models representing crystals in which the axial planes are not planes of symmetry, the strings marking the intercepts of the respective planes must often be prolonged to a crossing point beyond the axis and outside the completed model. This usually requires that the strings be guyed to some external support or framework, in order that the desired points common to two or more planes, when found, can be rigidly held in place (Fig. 4).

All the faces belonging to any particular crystal form may be outlined in this way by tying strings along their intersections. The shapes of faces resulting from the combination of different forms may be outlined by the same method. In building models representing combinations, it is of course necessary to choose different absolute intercepts for each form, in order that the faces may truncate each other and not merely meet in a point or line. The relative size of the faces of each form will be determined by the relation between the absolute intercepts chosen for each. (Fig. 2).

Covering the Model.

When all the intersections between faces have been found, the entire model will be outlined in a network of strings, although some appreciation of crystallography will be required to perceive it. (Fig. 6). For some purposes it may be advantageous to stop the construction at this stage, but it is generally desirable to complete the model by placing paper faces on the network. The writer and his students have done this by measuring the edges of the faces as outlined between knots on the strings, and then cutting out faces of the indicated size and shape from stiff drawing paper and glueing them together in their positions on the strings. Cardboard may be used instead of paper. It should also be possible to use transparent celluloid, as was done by H. T. U. Smith[2] in the construction of models illustrating the optical properties of crystals.

If the models have been constructed as theoretically perfect crystals, all faces of the same form should be of the same size and shape. Unfortunately this will not be strictly true unless all strings have been tied exactly in their correct positions, and held there. Every effort must be made during construction to tie each string as tightly as possible, in order to secure equal tension on all strings and to prevent sagging or slipping of the knots. The original axial cross must be rigid. In placing and tying strings, allowance must be made for the thickness of the axes. Changes in humidity during construction will cause a certain amount of sagging and stretching, although after the model has been completed further changes can be prevented by coating the strings with paint or lacquer. Because of these difficulties it is often necessary to compromise small distortions by slightly altering the size or shape of each face to fit its particular situation. This is usually more successful than trying to pull the strings and knots into their theoretically perfect alignment to fit a set of uniform faces, for the latter process is apt to cause serious distortion of the entire network.

Various methods of fastening the faces in place were tried. A fairly rigid model can be made by cutting each face with additional outer borders, which can be folded to form internal and external lap joints with the adjoining faces. The external overlaps, if well pressed down when glued together, do not constitute a serious disadvantage, but they can be eliminated and all overlaps made on the inside.

A second method consists in bending

2 Smith, H. T. U. — "Models to Aid in Visualizing the Optical Properties of Crystals". — *Am. Mineral.* 23, 629-643 (Oct. 1938).

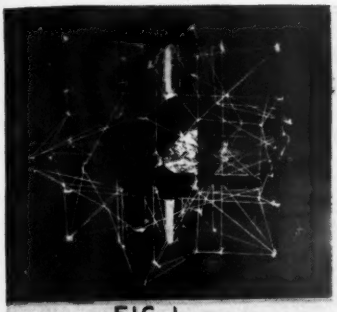


FIG. 1

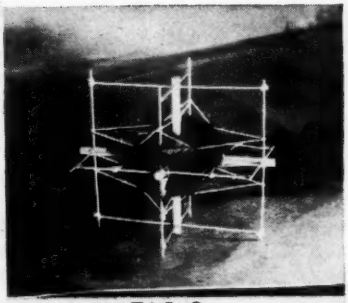


FIG. 2

FIG. 3

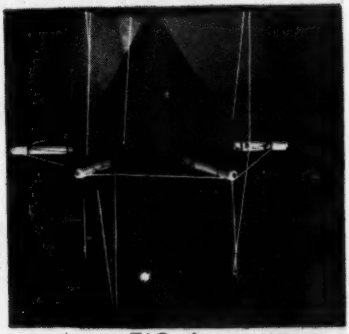


FIG. 4

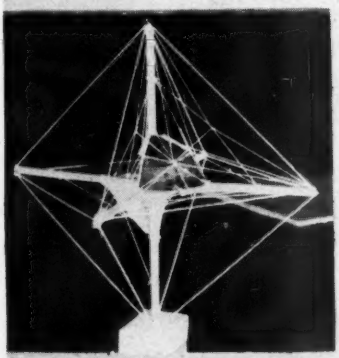


FIG. 5

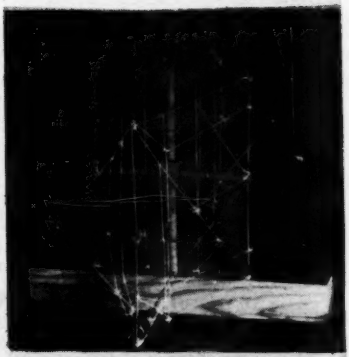


FIG. 6

Fig. 1:—Tetrahexahedron (by H. B. Smith).

Fig. 2:—Orthorhombic model, combining basal pinacoid, prism, and brachydome.

Fig. 3:—Isometric trapezohedron, in course of construction (by Ernest Ramey).

Fig. 4:—Trigonal trapezohedron.

Fig. 5:—One octant of hexoctahedron; trisoctahedron in opposite octant.

Fig. 6:—Network for monoclinic model.

the border strips left around the perimeter of each face to somewhat more than right angles with the face itself, and glueing them as butt joints, inside the model, to the corresponding strips of the adjoining faces. However, considerable difficulty is experienced in pressing such joints together, and in making good joints with the last face inserted.

A third method tried was to cut all faces to their exact shapes and then to fasten them together with thin strips of transparent Scotch tape. This thin tape produces only slight irregularity on the outer surface of the model after it has been painted over.

The last two methods require very exact fitting of the faces, whereas in the lap joint method slight discrepancies may be taken care of in the overlap. In all methods the faces and the border strips must be cut to permit the emergence of the axes and strings.

Painting and Finishing

After all faces have been securely glued in place, the entire model may be painted. In addition to improving its appearance, this has the advantage of stiffening the paper faces, preventing expansion and contraction with changing humidity, and increasing the durability and rigidity of the model. Ordinary household enamel was found fairly satisfactory for this purpose. A lacquer or "dope" formerly sold for coating model airplanes was tried on one model. This builds up a film which helps to conceal the irregularities caused by the lapped or taped joints, but it also tends to reduce the sharpness of the model's edges.

Advantages and Disadvantages.

The above-described method of constructing crystal models has the great advantage of being three-dimensional from start to finish. The writer has found it a great aid to three-dimensional thinking, both for himself and for his students.

The relation of the intercepts of each face to the axial ratio of the desired crystal is clearly shown, and in fact must be clearly understood at the very beginning of the construction. The importance of the relative intercepts of a face on the various axes, as contrasted with the absolute distances from the center, is also well brought out. This is particularly true in combinations of forms, where any desired equal or unequal development can be produced by choosing different absolute intercepts for each form. Similarly, models of "distorted" crystals may be obtained by the use of different absolute intercepts for different faces of the same form.

The method also shows particularly well the relations between different forms having the same indices but different symmetry. Having tied strings in all possible positions for a given set of intercepts, the student may produce the holohedral, the hemihedral, or the tetartohedral forms by selecting and extending the proper planes and finding their intersections. For example, in the hexagonal system the relation between the dihexagonal bipyramid, the third order hexagonal bipyramid, the ditrigonal scalenohedron, and the trigonal trapezohedron may be well illustrated in this way.

On the other hand, the entire symmetry of the desired crystal does not appear until construction of the model is nearly complete. For some purposes this may be a disadvantage. The intercepts of the faces, and not the symmetry, are the basis of the construction.

Practically, the method often requires considerable manual dexterity in tying a large number of strings within a restricted space. Consequently there is a minimum workable size for every model, which increases with the complexity of the crystal it is designed to represent. The tendency is to start with too small a unit distance on too small an axial cross. Unit distances of the order of one and one half to two inches were found to be a practical minimum.

The difficulties of equalizing the tension on the various strings, of avoiding stretching and sagging, and of placing the paper faces have already been mentioned. Failure in these respects may result in very bad distortion, which may not be apparent until construction is well under way.

The completed models are bulky and somewhat difficult to store without dam-

age because of their protruding axes and strings. For the same reason they are not well adapted to measurement of external interfacial angles with a contact goniometer.

Although the above difficulties make the construction of a good model rather time-consuming, the three-dimensional thinking required to build even one of the simpler models is believed to make the method well worth while as a teaching device.

MY THUMB NAIL COLLECTION

By MRS. J. E. SPECK

From a child I have always been fascinated by anything small — a tiny flower, a humming bird, or a small colorful pebble — and as I have grown older my love for small things has grown, too. After I began collecting minerals as a hobby, I found myself saving all the tiny specimens.

On field trips or picnics I was always looking for small specimens. It might be a desert rose, a translucent chalcedony no larger than a dime, or a tiny cluster of crystals — fragile and beautiful, or a thunder egg no larger than an overgrown pea, but all treasures tucked away in my pocket and carried safely home and added to my growing collection.

But my problem was how to display my small beauties, for to most people they were only just little bits of rock all poured into a box.

Then a friend who saw I liked small specimens presented me with a small box containing 25 "thumb nail" specimens of some rare minerals I long had wanted. How thrilled I was with this box, with its 25 lovely little crystals each in a one inch compartment on a bed of cotton! It was an answer to my silent prayer for now I knew how to display the small specimens in my collection. And through the kindness of another friend, I was able to purchase boxes made for this very purpose but for holding 50 specimens each.

Now I can raise the lid of a box and there before me are fifty of my little treasures. As a friend remarked when he opened th lid of one of them, "Why they look like jewel cases!" My ambition now is to have one thumb nail specimen of every known mineral .

So the search goes on for small, new, and different specimens for my growing collection in the little black boxes!

OLD-COPPER INDIAN EXHIBIT AT CHICAGO MUSEUM

Examples of objects representing the first use of copper in North America — probably before A.D. 700, by the "Old-Copper Indians" — are shown in a new exhibit just added to the Hall of American Archaeology at the Chicago Natural History Museum, Chicago, Ill.

"Few people realize that a copper industry had been developed that early in America," says George I. Quimby, curator of exhibits in the department of anthropology, who is one of those responsible for the preparation of the display. "These Indians, representing the archaic stage of the early woodland tribes, made their tools and weapons of copper — and were thus advanced in this respect not only over their predecessors but even beyond later American Indians who were still using bone and stone for these purposes centuries later. Their use of copper was entirely for utilitarian purposes; they did not use it for ornaments as was done by later tribes."

The Indians who did this work inhabited the upper Great Lakes Region and obtained their raw copper from the south shore of Lake Superior, Quimby states. They shaped their implements and weapons by cold hammering or by alternate heating and hammering — the melting and casting of copper were unknown. In the exhibit several of the specimens have been cleaned to show how they looked when new; others have been left with their full patina as discovered.

COPPEROPOLIS, CALIFORNIA

Scene of Attractive Copper-Sulphide Minerals, and Emerald-Green Garnets

By T. ORCHARD LISLE

Although a paved highway runs right through a huge mine dump, I have a sneaking suspicion that Copperopolis, California, has been almost 100 percent overlooked by rockhounds as a good mineral specimen locality. This paved road is a good, but secondary, thoroughfare that happens to run almost parallel, but north of the main highway from Stockton to the Mother Lode country and to Yosemite Valley. There is no sizeable town on this route so it is used only for district travelling. The distance from San Francisco is just over 100 miles to the east. (Copperopolis is in southern Calaveras County).

When I went to San Francisco in 1941 and resided there until the summer of 1944, I pored over maps and studied numerous bulletins issued by the State Division of Mines in an effort to locate "happy hunting grounds" for minerals. I joined two local mineral societies in the hope of learning about good locations from members; but eventually 'discovered' far more myself then members told me about. On the map the name Copperopolis intrigued me, as I realized that it should mean copper mining at some period, and that copper deposits often form the source of beautiful museum specimens.

One day, having been to Jamestown to visit the Harvard mine, where I obtained some of that pretty green-white-and-black rock, Mariposite, I decided to return via Copperopolis and have a looksee. "Jimtown" mariposite, by the way, makes pleasing bookends, ashtrays and cabochons, especially when studded with pyrite.

There is a small village at Copperopolis, and where the road turns right in the center of the village, towards Framingham and Stockton, it passes through the old rockpile. The latter extends at least a quarter-mile on either side, and the rocks came from the old Keystone mine workings that has been operated at various times since 1850. Prior to that date some $19,000,000 worth of copper was produced in the district, half of which came from Keystone. This rockpile must contain thousands of tons of rocks, which are a drab brown on the surface due to many years of weathering and oxidiation. At the time of my first visit I made but a cursory examination;

The author (left) finds some native mercury and cinnabar at a locality about 25 miles from San Francisco, California.

but found some nice milky quartz studded with iridescent pyrite and streaked with iron, which cut into unusual cabochons.

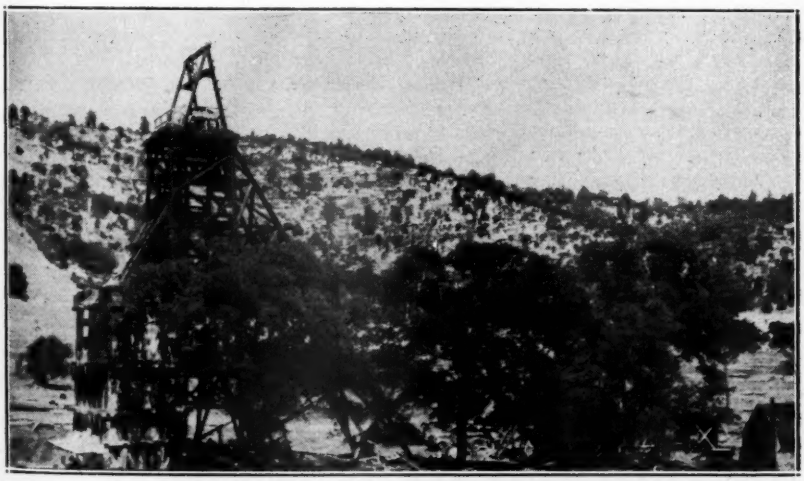
My main attention, however, was centered on the new shaft of the Keystone mine, which had recently been reopened and was in full operation. It is located a little way out of the village on the road to Angels Camp. Permission was very kindly given to me to search the new dumps by M. E. Bush, superintendent and part owner. The ore is a black pyritous slate contained in a belt of amphibolite schist. Two distinct periods of mineralization are represented in the area, the first of which was fractured, and followed by the secondary enrichment. Copper is obtained from the chalcopyrite and copper sulphide, and runs mostly from four to five per cent copper when smelted.

This black slate is full of veins and lumps of peacock chalcopyrite, and forms lovely cabinet specimens. As it comes fresh from the mine it is covered with mud, but when washed, or broken by a hammer, the lovely colors are at once revealed. One of the miners told me that down in the 635 ft. level of the mine, the scintillating ore is a wonderful sight to behold.

Some of the ore, however, is solid copper sulphide containing iron, and runs up to 40 per cent copper. Large lumps come out of the mine. In appearance this ore looks exactly like rough iron that has been heavily gilded. The less iron content there is the more it resembles solid gold, for some ore is richer in copper than other.

Two years ago, or about two years after the Keystone mine was reopened, its controlling interest was purchased by the Lava Cap gold mining concern of Nevada City, California, and the output of copper trebled.

Six miles from Copperopolis there is an abandoned chrome working on a ranch, where clusters of Uvarovite or emerald—green garnets were taken out several years ago. One day Harold Soper, former president of the Northern California Mineral Society, and I decided to visit the location. Our directions were not clear. Instead of following the road right out of the village we correctly continued straight for about a half mile, and entered a ranch gate on the left. We drove for three miles over the worst kind of crude and rocky road, expecting



The new shaft at the Keystone mine, Copperopolis, California.

every minute to have a broken axle. Then we came to a stream in which the water was shallow enough for us to drive through. On the left was a farm house, where we stopped for further directions. We were told to drive three miles further until we came to another ranch, and then take the dirt trail to the left for a short distance to a shed, and then walk down the hill and up to other side where we would find the mine; but to ask first at the ranch for better directions. The road got a little better, and not so rocky.

When we reached the second ranch house, we found it to be deserted, and a sign posted saying that the owner had gone to war. The road ended just past the house. We walked all over the place, but never found the mine, so after an hour we gave up, as it was getting to the late afternoon, and we had to return to San Francisco. I heard later that Mr. Soper, now with the telephone company in San Diego, returned later and found the mine and some green garnets. However, anyone who wishes to find this chrome mine had first obtain a sketch map of the location and obtain proper directions. Among the men who are said to have been there and secured excellent specimens are Dr. Le Strange, Mokelumne Hill, Calavaras County, California, and H. Goudey, formerly of Jamestown, California, but now living at Yerington, (Box 401), Nevada.

MINERALS OF RICHMOND, AUSTRALIA

One of the famous localities of Australia are the old basalt quarries in Richmond, in the southeastern part of the country. Richmond is a suburb of Melbourne, being about 2 or 3 miles east from the center of the city. Melbourne, a port in southern Victoria, is the second largest city of Australia.

The quarries, known as the Council Quarries and worked by the City of Melbourne, are practically worked out and have been abandoned for some time. In their days, the quarries produced a number of interesting minerals, many of which found their way to America to enrich museums and private collections. Among the minerals known from the quarries are:

Analcite: in crystals associated with phacolite, chabazite, etc.

Aragonite: white acicular crystals in basalt.

Calcite: in crystals associated with phacolite, chabazite, etc.

Ferricalcite: a unique variety of calcite occurring in brown tufts of acicular crystals. It resembles aragonite in habit and stilbite in color.

Chabazite: beautiful glassy crystals found in cavities of basalt and associated with analcite, calcite, phillipsite, stilbite, etc.

Phacolite: a variety of chabazite, also known as seebachite or herschellite. Occurs in crystals of great beauty — colorless, glassy — on basalt. Phacolite is associated with analcite, calcite, phillipsite, stilbite, etc.

Mesolite: white capillary crystals and globules. Sometimes large and very showy, on basalt.

Phillipsite: colorless and often transparent crystals with chabazite, phacolite, and ferricalcite on basalt.

Stilbite: sheaf-like groups of brown crystals associated with chabazite, phacolite, etc.

ACKNOWLEDGMENT

We are indebted to Mr. N. E. Seward, the noted opal dealer of Melbourne, Australia, for information on the Richmond quarries.

APACHE VANADIUM MINE

By H. S. KEITHLEY

In mineral collections throughout the country, ranging in size from micro-mounts to museum pieces, can be found the showy and attractive specimens of sparkling vanadinite and associate minerals from this well-known mine. The property is situated in low, rolling hills north of Globe, in Gila county, Arizona. The mine is not an old one, having been opened during the past twenty-five years. It was originally prospected for lead.

The vein strikes practically north-south and is perpendicular. Mineralization extends over a length of about 500 feet. It is cut off by faults on both ends. The fault on the north end, exposed in a short adit, is a fine geological study. The vein is on contact between quartzite (on west) and diabase intruded into the quartzite. The primary lead mineralization is deposited in contact-breccia with very little vein quartz. The principal lead mineral is galena altered to cerussite. Some willemite and a little sphalerite occur. Gold and silver values have not been of any great importance. Vanadinite occurs sparingly in vein, developed most prominently in swelling due to cross-fractures in the vein. The greatest development of vanadinite and descloizite is in the quartzite to the west of the vein. The vanadinite developed best in the larger fractures; descloizite predominated in the minute fractures. With the vanadium minerals are rhombs of dolomite, rosettes of calcite and rosettes of siderite. A few cavities contain secondary quartz in well-formed small crystals of appx. 1 mm in diameter. On these minute quartz crystals have formed vanadinite, descloizite and dolomite. Dolomite on quartz is rare; vanadinite and descloizite on quartz more abundant. Descloizite in thick druses also occurs coating the vanadinite, calcite and dolomite. These combinations of minute crystals—the snow-white of the dolomite, the cherry-red of vanadinite, satiny luster of light to dark brown descloizite and the translucent calcite spread in thin, wavy layers (often over other vanadinite crystals) make micro-mount specimens of unusual beauty. They have to be seen under the binoculars to be appreciated. They are indeed very choice items.

Another combination—in specimens of all sizes—is vanadinite with druses of jet-black mottramite, occasionally with the snow-white rosettes of calcite. The vanadinite crystals are both conventional and modified. The writer, while removing material from a side wall, accidentally opened a narrow fissure. From it poured a stream of detached vanadinite crystals, ranging in color from light to dark red, from appx. 1/8" to 1/4" in diameter. Their modification was so great they hardly resembled vanadinite. Their forms might well be described as fantastic. Due to their flower-like "arms" or extensions they were quite fragile. They were better displayed as micro-mounts.

The vanadium minerals do not extend to the permanent water level but have a range of about 15 feet above it. Westward from the contact the fracturing in quartzite and the vanadium minerals decrease. However, vanadium minerals are found westward on the surface and in shallow pits for a distance of two or three hundred feet of the contact, especially where the quartzite has been shattered. In the diabase, east of the contact, no vanadium minerals are found. Neither vanadinite or descloizite is very severely altered on exposure. Material lying on the dumps for over twenty years is somewhat bleached, but the angles are still sharp. While the best specimen material, from the quartzite area close to the contact, shows the characteristic cherry-red crystals, orange to brown shades—common at other Arizona localities—are almost lacking.

Give Victory Bonds for Christmas

GEOLOGIC AGE OF THE NEW YORK CITY ROCKS

By CECIL H. KINDLE

In the August, 1945, number of *Rocks and Minerals* appeared an article by Thomas W. Fluhr on "Correlation of the Fordham Gneiss." I read it with interest for it is one of the few articles which have been published by an active worker on the rocks of Westchester County and New York City. It provides the last nail for the coffin of the oft repeated claim of the pre-Cambrian age of the New York City bedrock. The formations referred to are the Fordham gneiss at the base, the Inwood marble and the overlying Manhattan schist.

The latter two formations are shown on Merrill's 1901 geologic map of New York State as being the metamorphic equivalents of limestones and overlying Ordovician shales in Dutchess County north of the Highlands. More detailed mapping by Balk traced the increasing metamorphism of these rocks to the East in Dutchess County and their distribution around the northeast end of the Highlands down into Westchester County. (Structural and Petrologic Studies in Dutchess County, New York. Bulletin of the Geological Society of America, Vol. 47, pp. 685-774, 21 pls, 38 figs. 1936)

This should lead to general acceptance of the Paleozoic age of the Manhattan and the Inwood formations except for one discrepancy. In Dutchess County and further north in the Hudson Valley a considerable thickness of shale and, in places, limestone of Cambrian age lies below the limestone with which the Inwood marble has been correlated and above the pre-Cambrian gneiss. This thick sequence heretofore has not been recognized in the New York City sequence of formations. Its absence has been very comforting to those whose minds react to metamorphic rocks with the word "pre-Cambrian". Now Fluhr's article lets us know that the Fordham gneiss is not the gneiss of the Highlands. It is reasonable to suppose that it represents the long missing (but strangely enough, not missed) sequence of Cambrian strata that is older than the Wappinger limestone of Dutchess County.

This sequence of Cambrian strata has been largely overlooked because too much attention has been focussed on its lower layer, a quartzite. The shale which provides most of its thickness usually weathers so that it does not obtrude itself on one's observation. Actually the amount of quartzite present is very little. On the Taconic State Parkway where one descends from the Highlands into Dutchess County a road cut shows a few quartzite layers interbedded with much shale. At the Peekskill fault block there is one bed possibly 20 feet thick, but the road leading up the hill to that outcrop passes thin-bedded quartzite and shale with some of the shale showing mica flakes due to partial metamorphism. Completely metamorphosed it should have the appearance of the Fordham gneiss Fettke described the rocks of the Peekskill fault block in his study of the Manhattan schist (The Manhattan schist of southeastern New York State and its associated igneous rocks. New York Academy Science, An. 23, pp. 193-260. 1914). He presented arguments for the Paleozoic and for the pre-Cambrian age of the Manhattan formation. Most of his arguments and the best ones were for its Paleozoic age.

The only positive argument that the New York City rocks are pre-Cambrian is to correlate the Inwood marble with the marble which occurs in places with the gneiss of the Highlands. This argument falls to the ground on the stratigraphic basis. No Manhattan schist lies above it and as Fluhr now tells us the gneiss below it is not the Fordham gneiss. On the contrary, the stratigraphy tells us that the same sequence of rocks occurs in New York City and Westchester County as occurs in the Paleozoic rocks of Dutchess County.

It is interesting to see how the Paleozoic age of the New York City rocks fits in with other geological observations even though such may not be regarded as

proofs of its age. In Bucher's book, "The Deformation of the Earth's Crust" a number of "laws" describe the manner in which the earth's crust acts. Law number 32 is "By far most acid intrusives cut across the structures produced by the folding pressure in such a way as to indicate that they arrived after the folding but so shortly after, that they must bear a genetic relation to the orogenic phase." In other words, the granite pegmatite of Bedford, Westchester County, and the granite pegmatite dikes in the city were intruded shortly after the surrounding rocks were metamorphosed. The age of the Bedford granite pegmatite has been determined by the study of radioactive minerals in it to be of late Ordovician time. This fits well the Ordovician and Cambrian age assigned to the metamorphic rocks.

Another thought that comes to mind is the association of serpentine with the Manhattan formation at Hoboken and Staten Island. I am more of a stratigrapher than a petrologist and may be wrong in this but it is my belief that where large amounts of serpentine are found elsewhere in eastern North America, as in southeastern Quebec, Gaspe, and Newfoundland, it is always associated with Ordovician strata. This fits Merrill's map of New York State and the work of those who have thoroughly studied the rock formations of this part of the state.

When will the American Museum of Natural History come up to date and mark the age of these formations correctly on the relief model of the lower Hudson Valley? I do not know. I do know I would like to hear from those who refer these formations to the pre-Cambrian one good bit of evidence to support their view.

WORLD'S GREATEST VANADIUM DEPOSITS ARE IN PERU

The world's greatest vanadium deposits are at Minasragra, near Quisque, Pasco Province, Peru. These are unique deposits where a vanadium sulphide, patronite, occurs on a large scale as greenish-black masses associated with a hydrocarbon and small quantities of molybdenum, nickel, and iron sulphides, as a lens-shaped mass in red shale. The deposits are at an altitude of 16,000 feet in a barren desolate region, about 20 miles west from the city of Cerro de Pasco, in the western part of Peru.

Among the minerals found at Minasragra are:

Bravoite: small grains and crystal fragments, pale yellow in color. It is an iron-nickel sulphide and occurs with patronite.

Fernandinite: massive and of a dull green color. A hydrous calcium vanadyl vanadate.

Hewettite: in small deep red needles; an alteration product of patronite. A hydrous calcium vanadate.

Melanovanadite: small black needles in vanadate.

Metahewettite: earthy, brownish red masses. A hydrous calcium vanadate.

Minasragrite: bluish efflorescence on patronite. A hydrous vanadyl sulphate.

Pascoite: hydrous calcium vanadate. Found as dark red-orange to yellow-orange coatings on the walls of a mine tunnel.

Patronite: vanadium sulphide. The main ore mineral; it is greenish-black in color.

Pyrite: nickel-bearing.

Quisqueite: a black lustrous hydrocarbon.

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Tantalite at Wodgina, W. Australia

The old gold mining camp at Wodgina, in the Pilbara gold field in the northwestern part of Western Australia, has been abandoned for many years but the locality is worked and this time for tantalite. Here some old pegmatite dikes are worked for the mineral which occurs as grains and small masses up to 5 pounds. Many interesting minerals occur associated with the tantalite, among them are albite, garnet (spessartite), lepidolite, microcline, mackintoshite, hydrothorite, pilbarite, thorogummite, lithiophilite, apatite, beryl, etc.

"ANOTHER MINERALOGICAL VACATION IN MAINE"

By E. L. SAMPTER
As reported to the N. Y. Mineralogical Club

This past Summer, of 1945, with V-J Day, world peace and gasoline, was spent again in Oxford County, Maine. My wife and I had more mineralogical activities than ever; visited more quarries and found less specimens worth keeping. This was probably due to our being more fussy about what we take away and that most of the localities we were at, are ones that we had visited so often before. Now we see little new any more and are more particular about what we want.

Only two places had any blasting since 1944 — the famous Bumpus mine, which we visited six times and Bennett's. We were at 14 different quarries and called on Bickford, in Norway, Ike Skillin in Freeport and Perham in West Paris, Me. as well as the Monroe Mineral shop, at Monroe, N. Y. We were sorry to have missed Mr. Perham, who was out when we called. Skillin seems very active and was very friendly, as usual. He has a big stock of minerals now and quite a collection of spheres for sale, as well as the Wodiska collection of cut Tourmalines, in all colors. Mr. McElroy, the mineral dealer in Monroe. N. Y., whom we visited recently with Mr. Gutman, has a large stock of every kind of stone and crystal. He is a very pleasant man to deal with. The stock is all in a small room, in the rear of his house; very badly arranged and not marked, but any collector can find something of interest there and at the right price.

When we first visited the Bumpus, place, at Albany, Me., it was being worked for feldspar and beryl by Dana Douglas, of Portland. The whole top of the East wall had been cleared by bulldozers and about 20 holes had been drilled for blasting. We anticipated great finds. Practically no blasting was done. The little that had been done, just broke up some marvelous large beryl crystals into little pieces, which they saved in a shed. We got some, as well as plenty of their famous rose quartz, for a rock garden, but no good crystals. Something happened — perhaps V-J Day — but all work there has ceased and the Bumpus quarry is again idle. The shed is still full of beryl and the pit full of water, with nice large green frogs. There are still some perfect and very large blue beryl crystals in the walls and under the water, for some collector to acquire in the future.

We spent a great deal of time with Roscoe J. Whitney, who is being paid to do what every "rockhound" yearns to do all his life. Whitney was in charge of all of the government Mica projects in New England, with headquarters in Newport, N. H. Now he is a Pegmatite sleuth for the Whitehall Co., who operate mines and prospect for feldspar. He lived in a trailer, near us, with a very able Canadian assistant, who is a real woodsman. They covered the county by air, looking for signs of feldspar and then located them on the ground, by foot. As a result, he has two very interesting maps. One is an air map and the other a ground map, on which all of the feldspar deposits he saw were noted. Whitney is finding some marvelous large crystals and seeing all of the varied minerals in the Maine pegmatite formations. He has recently written me about a spodumene deposit with one crystal 7' x 2' x 1', which he has just located. He also has a large number of most interesting ground and air photographs, in color, showing the various rock formations and feldspar outcroppings.

We climbed Lord's Hill, made famous by Kunz and topaz, again for the fourth time and found no topaz crystals, as usual, in spite of all of the articles written about them. The goregous view from the top, overlooking Horseshoe Pond and Lake Kezar, is worth the effort, even if no reward in minerals is obtained. Slocum wrote a long article in the August, 1944, *Rocks and Minerals* about Lord's Hill and the difficulty he had in finding the pits. There is a clear and easy trail leading right up and it is well marked by the

"Chatham Trail Association" and the pits are just off the trail and simple to find, if one knows in which direction to look. They can easily be reached, from where we leave our car, in approximately an hour's walk, of which about one mile is on the level and one mile up the hill itself. I do not believe that the pits have changed much since Kunz blew them, in about 1880, but the hill is almost solid feldspar and may be worked next year, by a mining company.

We looked around "Ladies Delight", a ridge, with a romantic name, near Lovell village, from which place Robinson reported amethysts in his book of 1825. It was a very delightful walk, through a herd of young bulls, but no crystals were seen.

At the Lovejoy pits (just north of the Passaconaway Road, about 1 mile west of Conway, N. H.) we found plenty of the usual small smoky quartz crystals, in feldspars, and from there we visited the nearby Red Stone granite quarry, at Red Stone, N. H., which has been closed since the war. All of the machinery and tools have been sold, for war work. It will be worked again soon, but only for unfinished blocks of their well-known red and green granite, which has been used for many prominent buildings, during the past 75 years. Their office still has a nice collection of local crystals.

Mrs. Bennett's famous quarry, just west of Buckfield, Me., from which come so many specimens here in our museum, is being worked again for feldspar. I was sick and could not go in, but my wife was there. No crystals are found there now, as the present workings are above the zone of pockets, where the large quartz crystals came from.

We were again able to climb Mt. Newry, or Little Plumbago. It was a perfect day and only 40 miles from our camp. The pits are all idle again. We brought down indicolite, rubellite, watermelon tourmalines, spodumene, lepidolite, purpurite, amblygonite, pollucite and various other specimens of mica, quartz, feldspar, etc., but no rose quartz crystals, or good watermelon tourmalines, for which the locality is so well known.

Noyes Mountain, better known as the "Harvard Quarry", is still the favorite and best spot of all to visit. Mr. Noyes, whose name the hill bears, died this year. There one can always find plenty of all of the varieties of tourmaline, apatite, mica, feldspar, garnet and beautiful, but small, quartz formations. Gem specimens are of course very rare. Nearby is the "Yale Quarry", where Mr. Gutman and I have found beautiful, but small citrine crystals. A short distance from Noyes is Matti Waisanen's farm, where Douglas worked a very large place for mica last year. It is a most interesting geological sight, with a beautiful view and just off the road. We found many large apatite crystals and black tourmalines. Waisanen has a perfect black tourmaline crystal — 1' x 6" large.

Did not get to Mt. Mica this year, nor did we see Howard Irish, who owns it. Mt. Mica has not been worked, as anticipated last year. Intended going up Black mountain, but did not get to do so either. We heard that the mine has been closed and that the government has put in a fine road, making it very accessable now, by car.

This sounds like a repetition of my report of our activities for the past few years and so it is and always will be, if we continue to spend our summers in the same county, as we have for so long. Each year though, we enjoy it more, add to our collection and knowledge of Maine Pegmatite minerals; meet new friends with mineralogical interests and seek new localities to work in. If any member ever expects to be in Oxford County, Maine, I shall be only too glad to give full details, as to how and where to find the many quarries in that neighborhood.

It was with some very good friends from Boston, who are active members of the Boston Mineral Club and most enthusiastic "rockhounds", that we covered the county and again had a most enjoyable mineralogical summer in Maine.

HOBBIES

By GEORGE F. HILL
Elizabeth City, N. C.

I have collections of coins, paleontological and rocks and mineral specimens, and while playing recently with my ancient coins of Greece and Rome, I got to thinking about hobbies in general.

Hobbies can often become lonely pleasures. To get the greatest happiness out of a hobby, one must share it with others. The hobbyist discourses learnedly to a friend about his specimens and in doing so thrills to their limitless and fascinating potentialities. But when no friend can be found to share the hobby with him, how lonely be can become!

And how tormented and how tempted to do murder on occasion! "Here is an Alexander the Great coin. It was minted about 330 B.C." Thrilling at the anticipated pleasure you are giving a friend, you place the coin reverently in his hand. For a minute of silence he examines it and sagely catches on to your trickery: "It has no date on it; HOW DO YOU KNOW?" You gnash your teeth. "Is it real? HOW DO YOU KNOW?" You sigh in patience unlimited. "What is its buying value in United States money?" Then nothing but murder will satisfy.

Show him a trilobite or a fern mold in shale, explain its meaning, and he asks, "HOW DO YOU KNOW?" Show him a deep-sea shell from a Rocky Mountain peak, and he may hesitate a moment, but he will ask, "HOW DO YOU KNOW?" Place a "Herkimer diamond" in his hand and he admires it with, "Did you cut and polish this?" "No", you answer, "Nature makes them like that." He merely asks, "HOW DO YOU KNOW?" Place before him a piece of obsidian and tell him it came from a volcano. His eyes may grow bigger, but his mouth will erupt with, "HOW DO YOU KNOW?" Try to thrill him with an explanation of crystallization in magma, and he stares hard into your eyes, and not wanting to hurt your feelings by saying what he thinks, he only asks, HOW DO YOU KNOW?"

Show an acquaintance a piece of fulgurite and tell him it was formed about a tree root by lightning fusing the sand around it. He looks at you in profound pity, his heart aches for you because of your simple-minded credulity, but he politely asks, "HOW DO YOU KNOW?" Show an average man a simple halite cube, and tell him of the great inland sea in which it was formed but which is now dry and buried deep these hundred centuries beneath the earth of Michigan. His response to your intellectual stimulus is "HOW DO YOU KNOW?" Show him a pseudomorph after garnet, and carefully explain its meaning, and he only vomits another, "HOW DO YOU KNOW?" Show him a gastrolith and you take your life in your hands, but show it to him anyhow, and tell him that it is a stone from a dinosaur's gizzard. He stares at you quickly, he moves back a pace or two as though you were now getting dangerous, but written indelibly all over his face is the knowledge that you take him for an absolute fool, but he only says, "HOW DO YOU KNOW?"

I've often wondered if I said to a friend, "My name is Hill. My eyes are green. My head is bald, if some homo sapiens would ask me, "HOW DO YOU KNOW?"

Mere killing is far too gentle a death for some people. Beating to a flabby, bloody, limpid pulp would be far nearer a satisfactory consummation of one's honest feelings if justice is to be done.

I have practically quit showing anything to anybody any more, any time, anywhere, anyhow. I must know the friend is a kindred spirit and infected with the same sort of bug before I lead him into my sanctum sanctorum.

Hobby Clubs, each of its kind, permit birds of a feather to flock together and to speak a language all their own. These clubs are of high therapeutic value. They are necessary outlets for pent-up passions, and thereby conducive to sanity, decorum and good citizenship. The "Rocks

and Minerals" magazine, representing one phase of the hobby-horse, is a tonic to the rock hound more potent than the headiest wine, and its advertisements are an open spigot on the pocket book.

A hobbyist must have patience beyond astronomical measure; he must have ever present control of his temper, if he fears the fatal noose; he must be able to ignore the crass ignorance and suspicion of the uninitiated, if he wishes to keep his equilibrium. But knowing his specimens himself, he can love their every phase and gleam, for they speak to him a language he alone understands, and it warms his heart, it stretches wide his horizons, he forgives all and is happy.

AN INTERESTING DIABASE CUT IN NEW JERSEY

By PETER ZODAC

When one enters New Jersey by means of the 125th Street ferry from New York City, a huge rock excavation, which has the appearance of being the vertical face of a large quarry, is a prominent object on the Jersey shore — in fact it can be seen from New York City. And as the ferry nears the shore, the more conspicuous does the rock excavation become. Finally the ferry enters its slip at Edgewater, the passengers get off, and you enter a waiting bus, for Paterson, hoping that the route may pass close to the excavation. The bus finally starts, heads northward (towards the excavation), and after a few hundred feet begins to climb at a fairly steep grade for 2,000 feet or so, makes a hair-pin turn to the left and — the excavation is on your right; it is no quarry but a long and high road cut. The road continues on the steep grade for another 2,000 feet — famous Palisades Amusement Park is here — the bus makes a right angled turn and within a few hundred feet the apex of the hill is reached and the route from then on is on a level terrain.

The rock excavation is a vertical wall of diabase, 2,000 feet long, 100 feet high at its north end and 2 feet high at the south end. The diabase is dark gray in color but near the top it is dark yellowish brown (apparently due to staining); the rock is broken up into huge masses and blocks due to vertical and horizontal joints. About half-way between the top and bottom of the diabase exposure is a 6 foot horizontal layer of a darker rock which extends for some distance. It may be a sandstone stratum — at least it seems to have the appearance of this rock as one views it from the ground — and it, too, is much broken up by numerous horizontal and vertical joints.

Though the entire length of the outcrop was examined, the only mineral found was hyalite (opal) which is very common as grayish incrustations on the diabase; it is not fluorescent.

The diabase exposure borders the west edge of the road (State Highway). The outcrop is not only of considerable interest to a geologist, but the view from the road is most impressive — Edgewater is a few hundred feet below while the river with the many ships and New York City beyond present a most beautiful panorama.

Edgewater (on the west bank of the Hudson River) is in the southeastern part of Bergen County, in northeastern New Jersey.

Amethysts in South Africa

Fine gem quality amethyst crystals were once found in granite near the Yokeshei river bridge on the Pretoria-Johannesburg road. Many specimens from the locality were mined and exported to Europe and America — most were cut but a number found their way to museums and private collections.

Pale to deep purple amethyst crystals are known to occur on the southern slope of Vuurdood mountain on Goodhouse and at several other localities in Namaqualand.

Fine crystals, some doubly terminated, occur at Oribes, Brandberg Mountain, northern Namib, S. W. Africa.

"ME AND PA." TWO OLD ROCKHOUNDS.

Dear Editor:

A few days ago Pa was showing a neighbor his collection and I could see that Pa was becoming a bit peaved because the neighbor showed not the slightest interest. Except for an occasional "Uh huh!" he viewed some of the finest of polished jaspers and agates but he kept silent until Pa brought forth some specially prepared cabochons, pendants, lavaliers and eardrops that had been made from one specimen and with a final sigh, as if to say, if these don't get a raise out of you you have no eye for beauty, Pa said.

"All of these were made from that one piece in the back end of the tray and were finished to show comparison of the rough. Each piece was cut with the idea of making them all different but still to hold the distinguishing stringer of carnelian though each has a different shade of chalcedony that mingled with that streak of bright red."

Then Pa brought out another tray and fondly pointed to two specimens and said.

"These two agates produced all the finished gems you see in this tray and they also came from Stony Creek, 1 mile north of Orland, on 99W. in Glenn County, Calif.'"

Pa stood silent for a few minutes and then the neighbor casually remarked.

"What are you going to do with them?"

Though it came in the shape of a question it sounded more like the phrase, "So what!"

It seems that sorter upset Pa for a minute but he finally came out from under the blow to his pride, then he, as casually asked, "What are you going to do with all the flowers that you have spent so much time in watering and sweating over in extracting the weeds? They are mostly faded now or gone completely. The leaves are dropping and I can not say they look very inspiring. I know that you never sell any of your flowers which at their very best hold their beauty for six months only of the year."

Pa did not pause for his company to get in a word edgewise but simply took a deep breath and continued.

"These flowers of mine will never fade and the next generation may view them and say, 'these stones look as beautiful as they did fifty years ago.' It must be that Stony Creek is a regular flower garden for rockhounds as the records show that all these agates and those lovely breccia jaspers came from there."

Then Pa, with a triumphant smile, gently shoved the trays back into the cabinet, handed the neighbor a cigarette, and remarked.

"I suppose it is a rather dirty job to gather your bulbs and get the ground ready for next years crop of flowers."

"Our desires," Pa said, after the neighbor had left, "are the scales by which the weight of our pain or pleasures could be measured. Our actions are controlled by our desire to impress our associates with our importance or worth."

Pa picked up his *Quartz Family of Minerals* and as he idly thumbed the pages he admitted.

"I don't feel so good after the last remark I made about his next year's crop of flowers because it is the most cruel thing in the world to prove to another soul that you have him bested in an argument. It would have been better to allow my neighbor happiness in admiring what he considers as the most beautiful things to heap his admiration upon.'"

I agree with Pa so for this time that will be all. Sincerely,

Me, of the Two Old Rockhounds.

Corundum Hill, Penn.

The most important corundum locality in Pennsylvania are the mines on Corundum Hill, about 2 miles N. E. of Unionville, in southern Chester County (S. E. Penn.). The mineral has been found here in a number of colors, blue, gray, white, and often in good crystals. Some of the grayish crystals in white albite have furnished unusually fine specimens.

The mines have been abandoned for many years.

The Amateur Lapidary

CHARM BRACELETS OF STONE

By LUCILLE SANGER

Charm bracelets are perennial favorites. The average amateur lapidarist can easily make his own using agates or other stones. There is almost no limit to the variety of charms which can be made and hung on a wrist chain. We offer the following suggestions.

The heart charm

First is the heart charm. We doubt if there is a rock polisher in existence who has not made at least one heart. They have a sentimental attraction which few can resist, and to the lapidarist they offer a unique chance to harmonize pattern with shape to form a beautiful design. The hearts can be as small as half an inch for a small child to as large as may be desired. If more than two hearts are used it is better to keep them down to about an inch size.

Select hard stones which take a high polish, preferably agates. Many agates when cut yield a V banding which will cut a very attractive heart, the V lines running parallel with the edges of the heart and meeting at the point. Washington carnelian is a very good stone for this as it takes a brilliant polish and the small heart allows the outside edge of the slab to be utilized, since, in this agate, that is where the color is usually located and there is often some fine banding. Success lies in the care used in selecting and placing the pattern properly. It is not always possible to select a good pattern and at the same time preserve it if the heart is made as broad as it is long, which is thought by some to be the ideal shape. It may be necessary to lengthen or narrow it a little. A thin edge is desirable in a pendant, but in cutting charms, it is better to cut a narrow flat edge instead of a thin edge. There is less danger of breakage since a charm bracelet necessarily gets hard wear. Translucent or transparent stones are better than opaque ones, although the latter are good if of attractive color.

After the heart is cut and polished, it should be drilled vertically to receive the peg.

The "Coin" charm

The second type is the "coin" charm. For this, use stones which take a very high polish and which are hard. They may be transparent, translucent or opaque. Any of these offer a chance to place a good pattern or perhaps a figure or scene. Many of the jaspers, even though not listed by the dealers as scenic, offer fine scenes, and a great many of them yield bouquets or flower gardens, even the common ones which can be picked up anywhere.

Select slabs one-eighth of an inch thick. Take a coin of the size desired and either with a pencil or stylus of aluminum (or brass) mark around the coin. Grind a straight edge down to this line and then mount on a dop stick. If the surface is polished at this stage, it will look at if it were lower in the center than at the outer edge, so put the "coin" on the wheel and round very slightly in a cabochon shape. If this is done correctly, the "coin" will look flat, but without seeming to be hollow in the center. Polish this surface and the edge and remove from dop. Repeat on the other side. If the pattern has a top and bottom to it, then drill vertically on the edge above the top of the pattern.

On both the heart and "coin" bracelets as many charms may be used as desired. If the peg with loop is inserted so that the charm lies flat (when bracelet lies on a table) fewer will be required, probably five or six. But if, when the bracelet is lying on a table, the edges of the charm touch the table, more charms will be needed to achieve the same effect. When setting the pegs, keep in mind which way the charms will hang and set the pegs accordingly.

A set of bridge charms

A set of bridge charms makes an attractive bracelet. Plain stones, either opaque or clear, should be used for these. Any attempt to place a design or scene in this type of charm, will ruin both the stone and the pattern, since the shape of the stone will detract from the pattern and the pattern will throw the shape of the stone out of focus.

For these, templets of the size desired should be made from copper or some metal which can be filed to a smooth even edge. Select one-eighth inch slabs and draw around the templete. Grind the stone to the template mark. If the club and spade are to be made realistically, a hand grinder will be necessary to finish the deepest part of the V's where the lobes of the club meet and on the V's at the stem of both the club and the spade. Now mount on dop sticks and gently round off the edges as in the "coins." Remove from the dop stick and repeat on the other side.

When cutting the diamond charm, hold the top edge (which is one-eighth inch long) against the outside edge of the cutting wheel. Or better still, use a V-shaped carborundum stick and do this operation by hand. The object is to make a slight indentation to receive the drill and yet leave the back and front faces of the charm intact in its diamond shape. Drill the heart and diamond vertically from the top and the club and spade vertically from the bottom of the stem.

Charm bracelets made of pebbles

There are many interesting pebbles found in many different places. Nearly every collector has several polished either on one side or in the round for exhibit. Many of them have very fine patterns and gay colors. The Thomsonites, spherotite jaspers and Lake Superior agate pebbles are among some of the most attractive. When polished in the round, drilled and hung on a chain, they make very attractive charm bracelets.

Charm bracelets made of cubes

Small cubes cut from such materials as green jade, Mojave Desert chalcedony, or any unpatterned stone of solid color, make an interesting variation. These may be drilled either in the center of one face, or on a corner. If drilled on a corner, touch the corner very lightly to the wheel to make a flat place just large enough for the drill. This spot should be polished before drilling. When made of rock crystal, this type of charm resembles ice cubes.

Tear-drop charms

Everyone is familiar with the tear-drop shape. These can be made of any hard translucent or transparent stone and drilled vertically at the small end. Good material for making small spheres for drilled charms is agate, rock crystal or other quartz stones.

Chains for bracelets

There are many types of chains on the market, or will be soon, from which to choose, if a machine-made chain is preferred. However, a hand-made chain adds much to the attractiveness of the bracelet and does not detract from the beauty of the stone. In either case, do not select a large heavy chain for small stones and vice versa. If a chain is to be made, be sure to solder each link, and this may have to be done even if a machine-made is used as some commercial chains are not soldered. When the chain is finished, make the pegs for the stones and decide on the spacing. If a commercial chain is used, make links, but if a hand-made chain is used, the left-over links may be used here. Put a peg on a loose link and put the link on the link of the bracelet previously decided upon. When all the pegs are fastened to the bracelet chain, solder the joints of the links. Pickle, polish and wash. Set the pegs into the stones, fasten the bracelet around a wrist and call it a day.

Uranium Ores Safe to Handle

Due to the publicity given atomic bombs, many collectors are adding uranium minerals to their collections. There is such a demand for these minerals that dealers stocks are being depleted rapidly. Some amateur collectors, however, have hesitated to order them under the impression that they may not be safe to handle. Uranium ores and minerals are safe to handle — just as safe as any ordinary mineral in a collection.

Club and Society Notes

ELECTION NIGHT AT LOS ANGELES MINERALOGICAL SOCIETY MEETING

The main event of the Los Angeles Mineralogical Society meeting of October 18th, 1945, was the election of officers and the members are to be congratulated on the selection of a worthy and able crew, as follows:

President ..... Wm. R. Harriman
1st Vice-President .... G. Haven Bishop
2nd Vice-President ..... Frank Larkin
Secretary ..... Rosalie Gotfredson
Treasurer ..... Beth McLeod
Field Trip Chairman .... Helyn Lehman
Business Manager ..... Alma Newell
Federation Representative Richard Lehman
Editor ..... Gertrude C. Logan

The Society has made very fine progress during the past year and with the removal of many hampering conditions and restrictions, looks forward to enlarged activities and greater enjoyment of their common interest.

There was no speaker appointed for this evening but Dick Lehman gave an impromptu talk on a ten day trip he just concluded to Arizona, visiting Bisbee, Jerome, Tombstone and other points and with his usual aptitude for combining business with pleasure, Dick managed to bring back with him some fine specimens of boronite, vanadinite, asbestos, etc. Among other interesting facts, he told about some asbestos he saw with fibers over 12 inches long and strangely enough there is no market for it, which surprised us.

In his annual report, Doctor Hill announced that the Board of Education is making a class room at Polytechnic High available on Sunday mornings and classes will be conducted by qualified members of our Society, who will take turns, giving the boys more detailed instruction in the origin and uses of various minerals. This is a follow-up on the work which has been so ably done by Mr. Ernest Peterson.

It is expected that field trips will again be a feature of the Society's activities and in this connection Gordon Funk pointed out that some prospecting should be done to locate new areas of interest, as most of the places where desirable material could be found had been about worked out. Scouting parties will attempt to blaze some new trails for the future.

Mr. Benedict won the door prize, a very fine boronite specimen from Bisbee, Arizona. In the book raffle, Luella Augustine won first prize and Ada Larkin second.

Just to give us something to look forward to, there were rumors going 'round concerning the annual Christmas Party, plans for which will probably be announced shortly.

The November meeting of the Society will be earlier in the month than usual, as the third Thursday falls on November 15th.

Howard Paget, Publicity Chairman

Boston Mineral Club

A regular meeting of the Club was held on November 6, 1945. Rudolf C. B. Bartsch, President of the Club, spoke on "Gold collecting in the Byron District of Maine." Kodachrome slides of the Byron district and other New England scenes were shown by George E. Holman.

The Club meets at the New England Museum of Natural History, Boston, Mass.

Colorado Mineral Society

A regular meeting of the Society was held on November 2, 1945, at the Museum of Natural History, Denver, Colo. The Society was addressed by Prof. Roy G. Coffin whose subject was "Minerals of Northern Colorado."

East Bay Mineral Society

Two meetings of the Society were held during November, 1945. On November 1st, Francis T. Jones was the speaker whose subject was "Optical Crystallography". On November 15th, C. L. Mills spoke on Mexico.

The Society meets at the Auditorium Lincoln School, Oakland, Calif.

Los Angeles Lapidary Society

A regular meeting of the Society was held on November 5, 1945, at the Royal Palms Hotel, Los Angeles, Calif. G. Haven Bishop, one of the Society's Charter Members, who has recently returned from Central America, gave a talk illustrated with Kodachrome slides, on road building, customs and home life of the people, vegetation, geology and scenic views of Costa Rica, Honduras, Guatemala, Salvador, Nicaragua, and Panama. C. R. Standridge, another member, spoke on the "Emerald".

New Jersey Mineralogical Society

A regular meeting of the Society was held on November 13, 1945, at the Public Library, Plainfield, N. J. Reports by members on summer collecting experiences was the chief event of the meeting.

Newark Mineralogical Society

The 235th meeting of the Society was held on November 4, 1945, at the Newark Museum, Newark, N. J. The program for the meeting consisted of a talk by Richard P. Milburn on oxides and dioxides.

Colorado Springs Mineralogical Society

The Colorado Springs Mineralogical Society has had a comprehensive and interesting year, with considerable activity and several very special and notable programs.

Our year started last December with a program devoted to a subject of particular interest at that time, "Optical Calcite". Orville Reese, who spent several months in both Montana and Mexico prospecting for calcite deposits, gave us a talk on his experiences, and showed colored slides of Mexican localities and scenery. Dr. E. L. Timmons assisted by showing several dozen Kodachromes taken on his extensive travels south of the border. There were a number of fine specimens from the Reese collection on display, including some fine single and grouped pieces of a new and different type of capped calcite crystal.

Dr. Don Gould, of the Department of Geology of Colorado College, gave the Society a real treat in January by presenting an illustrated lecture on "The Geological History of the Pikes Peak Region." A large and appreciative crowd filled "The Pit" in Palmer Hall at the college to hear him.

The February program was devoted to the subject of "Quartz", with Clarence Coil giving an interesting talk and demonstration on "The Historical and Physical Properties of Quartz", and Prof. Willet R. Willis expertly presented the topic, "The Structure and Chemical Analysis of Quartz". Four microscopes with dozens of micro-mounts from this region's outstanding collections gave visible and substantiating evidence of the points made in the two speeches. The following month "The Strategic Minerals of Colorado" were emphasized, and in conjunction with this was an account of the early days of the mining camp of Caribou (now a ghost town), with old and historic pictures unearthed by persitence of Carl Mathews.

Otis Dozier, of the Fine Arts Center, and one of our most active members, gave us an account of his visit to the Harvard Museum, the National Museum at Washington, and the American Museum of Natural History in New York City. It was interesting to note that many exceptional specimens in these institutions came from Colorado, and some had been furnished by one of our members, Edwin Over. It is with real regret that we announce that Otis Dozier has left here to become associated with the Dallas Museum of Fine Arts.

One evening was given over to the subject "The Minerals of Arizona", with a talk listing the wide variety of minerals found there, and an extensive exhibit of strikingly colorful specimens to convince the skeptic. A suite of minerals from the Old Mammoth Mine was of particular interest. The following month's program gave an entire evening to the showing of microscopic specimens of the vivid and widely varied Arizona copper minerals and every one spent an enjoyable and profitable evening.

In May the Society cooperated with Colorado College in securing the presence of Dr. Fred Bullard, of the Department of Geology of the University of Texas. His lecture and pictures, based on five months of observation of the new volcano, El Paricutin, in Mexico, drew a capacity attendance, and late-comers were turned away because there was no standing room. Comments of recent date still attest to the interest aroused by this lecture.

There have been programs on the "Minerals of Maine" with the subject ably given by Lamont Keller; the "Minerals of Brazil", a map location talk given by George White; followed by an illustrated talk on "Tantalite Mining in Brazil". The climax of this series was a lecture, illustrated by Agfa and Kodachrome color slides, given by Dr. Frederick H. Pough, of the American Museum of Natural History on the subject of his trip to Brazil last year. We were exceedingly fortunate in persuading Dr. Pough to come to Colorado on his return from Paricutin volcano and other places in Mexico. The Society feels deeply indebted to the kindness of both Dr. Bullard and Dr. Pough, who are now honorary members of our organization.

Robert Wilfley, who has had a great deal of experience in prospecting for, and mining strategic minerals, gave a very fine talk on the minerals of the Gunnison district of western Colorado. He told of the finding of lepidolite, beryl, rubellite, and associated minerals, and had a large number of specimens of these, as well as crystallized columbite and microlite, to show. Every interested member was given a specimen of the largest flakes of lepidolite ever found.

Six reels of sound movies on Bolivia, its tin mining, spectacular scenery, and different peoples, gave our group an insight into another part of the world.

Just before gas rationing ceased, the Society sponsored a field trip up to the Crystal Peak territory where a number of specimens of smoky quartz, amazonite, and topaz crystals were found. Twenty members enjoyed the trip, the glorious day, and the picnic dinner. Several smaller groups made trips into different areas, and garnered good finds of iron pyrites and other material,. One group prospected a new location at Glen Cove, on the north slope of Pikes Peak, and uncovered smoky quartz crystals of inferior quality, some pale color microcline, and probably the finest and largest topaz crystal ever found within such a short distance of Colorado Springs.

A second trip to this location resulted in serious injury to one of our members, Clarence Coil, when a large rock above him suddenly broke loose, crashed down and pinned his leg against another large boulder. After several weeks on crutches, Coil is eager to go hunting again. Huge rock slides, precipitous chimneys, and towering cliff faces make this a

tricky and dangerous location, to be approached with real care. It is anticipated, however, that other good finds may occur there.

The Society has in preparation a booklet on the outstanding mineral localities in our vicinity — that is within a 100 mile radius of Pikes Peak. It will list the locations, the minerals (both rare and common) to be found there, the specific driving and hiking directions with highway numbers and trail descriptions, and the approximate mileage. The committee, Willard Wulff, George White, Timothy Anglund, and Robert Wilfley have put a lot of work on it, and have it about ready for printing.

Another project under consideration by the Society is the writing-up, editing, and publication of the numerous notes left by the late Lazard Cahn, world-famous crystallographer. It is hoped that thereby we might save this invaluable information from loss or destruction, present it to those most interested, and render a real service to the realm of mineralogists.

Robert L. Chadbourne, President

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Northern Ohio Guild
(American Gem Society)

A regular meeting of the Guild was held on November 13, 1945, at Western Reserve University, Cleveland, Ohio. Dr. Henry F. Donner, of the University, was the speaker whose subject was "The diamond" and "Fashioning of the diamond".

Pacific Mineral Society

A regular meeting of the Society was held on November 20, 1945, at the Asbury Apt. Hotel, Los Angeles, Calif. T/Sgt. Basil Andrews, of the U. S. Weather Bureau, was the speaker whose subject was "Greenland."

North Jersey Mineral Society

The 7th meeting of the North Jersey Mineral Society (formerly Paterson Mineral Society) was held on October 13, 1945, in the Paterson Museum, Paterson, N. J. The meeting was devoted to "Collecting experiences of the members".

Rochester Academy of Science
(Mineralogical Section)

A regular meeting of the Section was held on November 8, 1945, at the Rochester Museum of Arts and Sciences, Rochester, N. Y. The program consisted of a discussion on the physical properties of minerals (hardness and tenacity), and the showing of three sound movies — "Brazilian quartz goes to war"; "Wealth of the Andes"; and "Atacama Desert".

Wisconsin Geological Society

A regular meeting of the Society was held on November 5, 1945, at the Milwaukee Public Library,. Milwaukee, Wisconsin. The speaker for the meeting was Capt. Gilbert O. Raasch who spoke on the geology of North Africa and Europe.

Queens Mineral Society

A meeting of the Society was held on November 1, 1945, at its headquarters in Richmond Hill, N. Y. It was called to order at 8:25 p. m. There were 28 members and guests present.

Dr. Trautz announced the December meeting will be a conducted tour through the Picker X-Ray Corp. Laboratory. It was agreed that Thursday, December 13th, would be most convenient for the majority of the members. The members will meet at the Laboratory at 300 4th Avenue, near 23rd Street, New York City, at 8 p. m.

Mr. Segeler suggested that the Club purchase a desk lamp for more efficient illumination of the speakers displayed specimens. Mr. Zettl was appointed to inquire into the cost and efficiency of various lights. The Club voted that $20.00 be appropriated for this light.

The regular election date for officers of the Society was put forward to January in place of December, since it would interfere with the meeting at the Picker X-Ray Corp. Laboratory.

Mr. Segeler appointed Dr. Trautz, Mr. Kacsur, Mr. Marcin as the new program committee for 1946.

Miss Grothur was put in charge of the annual dinner for the first Thursday in February. Mr. Helbig and Mr. Stadler were appointed as the program committee for the annual dinner.

Rev. A. Hufnagel and Mr. T. Orchard Lisle were proposed and elected as new members.

Mr. Stadler suggested sending a note of thanks to both Mrs Fenton and Dr. Wilkerson of Rutgers University for the courtesies shown us. This was done.

The Beginners Course in Mineralogy will begin on November 20th at the home of Mr. Walter Helbig. The Elementary Course in Mineralogy will begin on December 2nd at the home of Mr. Segeler.

The meeting continued with Mr. Wm. C. Casperson, Curator of the Paterson Museum, as the speaker of the evening. He spoke on the minerals of Paterson, N. J.

The meeting adjourned at 10:40 p. m.

Respectfully submitted
T. Fredericks, Secretary.

Mineralogical Society of Hartford

A regular meeting of the Society was held on November 14, 1945, at 411 Homestead Avenue, Hartford, Conn. The subject for the meeting was on the use of petrography methods in analyzing minerals.

Marquette Geologists Association

A regular meeting of the Association was held on November 3, 1945. Dr. John Ball was the speaker at this meeting and his subject was "Short lessons in geology."

The Association meets at the Academy of Sciences, Chicago, Ill.

New York Mineralogical Club

American Museum of Natural History, New York, N. Y., Wednesday, October 17, 1945.

The meeting was called to order at 8 p. m. by Mr. O. Ivan Lee, the new president. There were 82 members and guests present.

The secretary read the minutes of the May meeting and they were approved as read.

Mr. Lee announced that there would be no business at this meeting and that the November meeting would be a social one, with refreshments.

Then the various members were called upon to describe their summer collecting adventures:

Mr. Merton McKown; Sayreville, N. J. — Pyrite; Cheshire, Conn. — Barite; Chester, Vt. — Magnetite, Pyrite, Talc; Portland, Conn.; Gore Mt., N. Y.; here there was no admittance but Mr. McKown managed to secure a few specimens of garnet; Willsboro, N. Y. — Wollastonite, Colophonite; Gouverneur, N. Y. — Diopside; Richville — Feldspar xls; Pierrepont, N. Y. — Tourmaline; Antwerp, and Rochester.

Mr. Leonard Morgan: Three trips to Haddam Neck, Conn., with excellent green and brown gemmy tourmalines to show for his work, also golden beryl and apatite xls. At Perkiomenville, Pa., Mr. Morgan found some massive pink natrolite suitable for polishing. Prospect Park, N. J. — calcite, stilbite, pink heulandite, orange calcite, agate. Berkeley Heights, N. J., nice polished specimen of carnelian as well as a fine botryoidal specimen. At Conway, N. H., he found smoky quartz xls, and feldspar. Grafton, N. H., gummite and uraninite.

Dr. Frederick H. Pough: Visited Paricutin Volcano, in Mexico, this summer and on the way back followed the *direct* route through New Mexico, where he visited Arthur Montgomery's prospects and saw tantalite ore, rose muscovite, spodumene, feldspar, and a calcite deposit with stained, banded calcite. Then he went up to Colorado Springs for a visit with the Mineral Club there and made several trips — one to a phenacite locality, one to St. Peter's Dome — from whence he brought back quartz, microcline, zircon, riebeckite, astrophyllite xls for the members of this club. Later he went with a party to Baldface Mt., N. H., which they did not climb but in the vicinity ran across some 18-sided beryl xls of some interest. In Berlin, N. H., (Green's Ledge) three fine clear white topaz xls were found. The weather was bad in Maine so the party went down to Woburn, Mass. (Blueberry Hill), where microscopic babingtonite xls, allanite, xls and epidote xls were found. They also stopped at Haddam Neck. Dr. Pough announced several publications: The current New England Telephone Co. Magazine which had an article on cutting and polishing, The G. S. A. Bulletin on Simpsonite by Dr. Pough, and the Jeweler's Dictionary to which he has also contributed.

Mr. James Taylor: North of Portsmouth, N. H., he ran across some more of the 18-sided beryls mentioned by Dr. Pough, and described the difficulty of obtaining them without a bath. He also visited the Ruggles Mine and said nothing of interest was coming out but that good things were still found on the dump.

Mr. Peter Zodac: At Great Falls, Md., found 4 specimens of native gold at an old gold mine, occurring with galena. Near Syracuse, N. Y., he found selenite plates in an old R. R. cut and at Chittanango Falls — celestite in limestone. At the old copper mine near Fairfield, Adams Co., Pa., Mr. Zodac found azurite, malachite, cuprite, and copper, associated together, which take a good polish. At the emery mines at Peekskill, N. Y., some corumdum xls of fair quality were discovered.

The president announced that during the summer the sister of George Kunz had been in to see Dr. Pough and left some serpentine specimens collected in 1880, by her brother. These specimens came from Castle Point, Hoboken. This locality was described by Henry Hudson's' first officer in 1609. The specimens were for distribution to the members of the club.

Mr. Joseph D'Agastino: Went with Dr. Pough to New England and reported for the benefit of the club that a curator really works very hard and certainly earns his salary. He also reported that there was a new and very active mineral club formed at Bellows Falls, Vt.

Col. Martin Erhmann: Was welcomed back to this country and civilian life after spending four months in Germany after V-E day. He told of one of the most famous collections in Germany that was hidden in a deserted mine for safety. At a bombed mineral museum at Iena he found specimens from Paterson, Westfield, and other American localities. He visited many museums and collections and found the Munich crystal collection under rubble, and the Braunschweig and Stuttgart collections destroyed. The University of Berlin Collection is supposedly safe but it is in Russian occupied Berlin.

Dr. Daniel O'Connell of City College had a field geology course at Maller's Bay, Vt. During his stay he visited a copper mine 10 miles north of Burlington and found only red jasper wtih specular hematite.

Dr. Robert Sosman erported on a new hydrocarbon mineral — anthraxolite — from Birmingham, Ala., shiny, conchoidal fracture, and is almost pure carbon: $C_{13}H_{10}$. It is in the same group as Curtisite $C_{24}H_{18}$. Mr. Lee mentioned in connection with this that he had visited Herkimer Co. N. Y., three years ago and found quartz xls with black inclusions that had never been properly identified.

Mr. Richard Gaines: Reported that he had been to Baldface Mt., N. H., after Dr. Pough and party left. He climed the mountain and

found some fair topaz xls in sand. He also visited East Hampton, Conn., and Mr. L. W. Little of that town took him to the Slocum quarry where he collected nice golden and aqua beryls.

Mr. Ernest Marshall: Reported that since the atom bomb he had to identify much local Connecticut material for people who thought they had uraninite. He also showed the pattern for a memorial to Father Francis Power, S. J., Michrochemist, that he had carved from cherry wood.

Mr. E. Lawrence Sampter read a report of his summer experiences in Maine and gave the secretary a copy of this report.

Miss Evelyn Waite: Visited Chester, Vt. and in New Hampshire someone gave her several specimens of an unknown fluorescent mineral which looked like feldspar. At Davenport Neck, New Rochelle, N. Y., she reported flints of various colors.

Mr. O. Ivan Lee: Reported on a new locality for quartz in Monroe Co., Pa., and presented the club with a set of accurate directions for finding the locality.

Mr. James Taylor suggested that members give the club specific directions to various localities and he volunteered to compile them.

The meeting was adjourned at 9:35 p. m.

Respectfully submitted
Bernadette Marcin

Georgia Mineral Society

A dinner for William B. Pitts, of San Francisco, Cailf., was held by the Society at the Atlanta Women's Club, Atlanta, Ga., on October 24, 1945. Mr. Pitts, who has given over his entire time to the making of thin sections of minerals mounted on 2 x 2 plates (to be shown by projection) exhibited, after the dinner, a number of such sections which showed a wide range of attractive colors and structual form from the specimens exhibited.

Mineralogical Society of Arizona

Two meetings of the Society were held in November, 1945. On November 1st. George D. Hough was the speaker whose subject was "A trip to Alaska". On November 15th, a motion picture "Sand and Flame" was shown.

The Society meets at the Arizona Museum, Phoenix, Arizona.

Yavapai Gem and Mineral Society

At their October meeting the Yavapai Gem and Mineral Society of Prescott, Arizona, heard a talk on the process of cutting radar crystals by A. De Angelis. He explained that most of the rock crystal from which they are cut comes from Brazil. Outstanding exhibits at the meeting were fluorescent minerals by junior member, John Butcher, Indian arrow heads by H. L. Womack, rare carvings in alabaster and white and gray soapstone from Russia by Mrs. J. Bryant Kasey, and odd and unusual Arizona rocks and minerals by Mr. and Mrs. Moulton B. Smith. Meetings are held the second Thursday of each month in the court house. Visitors are always welcome.

Ida Smith, Secretary

Monterey Bay Mineral Society

The fourth meeting of the Monterey Bay Mineral Society was held Monday evening, October 8th, at the Y. M. C. A., Salinas, Calif. Mr. J. D. Webster, electrical engineer with the General Electric Company in San Francisco spoke on "Uranium — Metal and Source of Atomic Energy", and gave an excellent explanation of neuclear theories and background for the layman's understanding of the atomic force. At the business meeting that followed, Mr. J. D. Herman of Salinas gave a group of mineral specimens to the club for its permanent display case. An exhibit (which is to be changed monthly) had been arranged from specimens loaned from the collections of T. G. Emmons, A. L. Jarvis, and A. W. Flippin, all of Salinas, and proved of great interest to the group. The Society voted to join the California Federation of Mineralogical Societies, and the club membership at this meeting reached 46.

The rising attendance has been interesting to watch: 1st meeting — 16 present, 2nd meeting — 23, 3rd meeting — 35, 4th meeting — 48 grown-ups plus 12 invited juniors. This I believe brings our Society's accomplishments up to date.

Jane B. Flippin, Secretary

Bloomington Geology Club

The Geology Club of Bloomington High School, Bloomington, Ill., had a window display in their city in November for American Education Week. The high school had displays in most of the store windows of the business section — the Geology Club had its display in the main book store (W. B. Read); and copies of *Rocks and Minerals* were featured also.

Mineralogical Society of the District of Columbia

A regular meeting of the Society was held on November 16, 1945, Dr. H. U. Smith, of the Geological Survey, was the speaker whose subject was "Giant glacier grooves" as found in Northwest Canada.

The Society meets in the U. S. National Museum, Washington, D. C.

Mineralogical Society of Southern California

"An evening with the volcanos of the world" was the subject for the meeting of the Society that was held on November 19, 1945, at the Public Library, Pasadena, Calif.

Maine Mineralogical and Geological Society

A discussion on mica, under the direction of Edward H. Leonard, was the subject at the meeting of the Society which was held on October 26, 1945, at 119 Exchange Street, Portland, Maine.

. . . With Our Dealers . . .

Warner & Grieger, of Pasadena, Calif., announce a new fluorescent lamp — the Radarlite. See their ad on this!!!

J. Gisler & Son, of San Francisco, Calif., are with us again. Their offer — Choice Western Minerals!

For the Micro-Mounter — a series of carefully selected unmounted xls — from the large stock of Hatfield Goudey, of Yerington, Nev.

A new advertiser this month is Lon Barlow, of New York City, whose facet cutting material should prove very popular with our readers.

Brown's Atelier, of Las Vegas, Nev., has some slabs of high quality material for advanced cutters.

John S. Albanese, of Newark, N. J., wants to renew acquaintances with all rockhounds. We are willing! How about you?

Crystals for Christmas! Try Schortmann's Minerals of Easthampton, Mass.

This Christmas add a fine water-clear quartz xl group to your collection, suggests J. L. Davis & Son, of Hot Springs, Ark.

For pictures done in fluorescent minerals, contact Thompson's Studio, Pomona, Calif.

Another new advertiser is The Erskine Collection, of La Jolla, Calif., who offers ruby zinc xls and other interesting minerals.

Seasonal specials and SKF arbors are this month's offerings of The Western Mineral Exchange, of Seattle, Wash.

Werner J. Vietzke, of Rapid River, Mich., has a large stock of Michigan rocks and minerals.

If you are making jewelry, A. L. Jarvis, of Watsonville, Calif., can supply many items.

The Wiener Mineral Co., of Tucson, Ariz., feature another list of fine minerals for collectors.

Vermont jasper—suitable for lapidary work. Ashley Mining Corp., of Charlestown, N. H., has it in stock.

Another new advertiser is Dennis-Schwartz, of Los Angeles, Calif., who can furnish interesting specimens at attractive prices.

Diamond drills for agate and other gem stones can be obtained from E. H. Shumaker, of Chicago, Ill., a new advertiser.

Still another new advertiser is Huntington Mineral Supply, of Huntington, Utah, who can supply selected copalite specimens.

The H. E. Powell Co., of Little Rock, Ark., is holding a pre-inventory mineral sale — good for 30 days only.

Roberts & Stevens, of Monterey Park, Calif., has some brilliant, sparkling colemanite on hand.

The Golden State Mineral Co., of El Monte, Calif., is an importer and exporter of fine specimens.

Gunnell's Comparative Crystal Collections are again available from E. Mitchell Gunnell, of Denver, Colo.

Geo. W. Chambers, the Desert Rat from E. Pasadena, Calif., has lost his lease and is had to give up his store. But one of these days he will get another place and his ads will again appear regularly in *Rocks and Minerals*.

We have another new advertiser, the Gem Stone Mining Co. of Durango, Colo., whose proprietor is Glenn Gardner, formerly of Oakland, Calif.

The Krueger Lapidaries, of Los Angeles, Calif., have some gem bargains this month.

Wilfred C. Eyles, of Bayfield, Colo., manufacturer of the famous "Streamliner" Diamond Saws, sells his product with an unconditional guarantee.

Turquoise for December is the Christmas gift suggestion of Silver State Specimens, of Mina, Nev.

Mrs. Richard Fischer, of Grand Junction, Colo., has a Christmas special for particular collectors.

A number of fine mineral specimens are reserved until the December issue of *Rocks and Minerals* makes its appearance — by Ward's Natural Science Est., of Rochester, N. Y.

As we go to press we obtain another advertiser, the Clarendon Gem Shop, of Clarendon, Texas. J. C. Estlack is the proprietor of the Gem Shop.